The Plans of Secondary Social Studies and Science Teachers for Teaching an Academically Diverse Class

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The University of Kansas
Center for Research on Learning No. 73

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August 1992

Running Head: The Plans of Secondary Teachers

This research in supported by a grant from the Office of Special Education and Rehabilitative Services (OSERS) within the United States Department of Education (Award #H023E90009) under the research initiative of "Research on General Education Teacher Planning and Adaptation for Students with Handicaps." The views expressed here are those of the Center for Research on Learning, and do not necessarily reflect official positions of the Office of Special Education and Rehabilitative Services, USDE.

Abstract

The goal of this research was to learn how teachers plan for instruction for their classes made up of academically diverse students. We sought to identify not only what they plan to teach, but also what resources they draw on in their planning and what pedagogical methods they view as most effective with academically diverse groups of students.

Forty-three teachers participated in 12 Cooperative Study Groups discussing the question "Thinking back on the last year of teaching, how did you plan for teaching science or social studies to an academically diverse group of students?"

In general, we found teachers plan around learning activities and the materials they have available. Content and how to organize it are also important elements in teachers' planning. The extent to which content is a major focus of planning may be a function of a teacher's experience; for some teachers who have taught a particular subject many times, content is a given and they turn their attention to other matters. Motivation and engaging students in learning was another important consideration for teachers in their planning.

Few teachers identified assessment of student learning as a factor in their planning. Nor did the teachers indicate that they regularly reconsider what content they will teach. These omissions suggest that teachers' planning may not address two of the fundamental issues of academic diversity in schools, namely, what do we expect all students to learn and how do we go about determining if instruction for that learning has been effective?

The Plans of Secondary Social Studies and Science Teachers for Teaching an Academically Diverse Class

John Goodlad (1984) has written that the major challenge of education in the United States today is no longer universal education but rather access to knowledge for all students. Many secondary teachers in public schools face this challenge daily as they seek to teach an increasingly diverse student population - diverse in academic preparation, ability and interest. Contributing to this diversity is the increasing number of students with disabilities who are being placed in general education settings for most of the school day (Lovitt, 1989). In the organizationally rigid setting of secondary schools, accommodating student academic diversity can be particularly difficult since secondary teachers see most of their students for only one period during the school day. Such limited daily contact makes it difficult for teachers to provide students with extra time and extra help in completing assignments.

The focus of the research reported here has been on identifying how secondary social studies and science teachers meet this challenge and plan for instruction to address the needs of all their students, including those with disabilities placed in mainstream classrooms.

It is our belief that teachers' knowledge about their content areas and the students in their classrooms can provide critical insights into the research and development process. To incorporate teacher knowledge and experience, we revised the traditional research and development process. Specifically, we established a cooperative *relationship* between our research staff and teachers for the purpose of identifying problems facing teachers of academically diverse classes.

To carry out the research, small work groups called Cooperative Study Groups (CSGs) were formed, comprised of teachers and investigators representing the research project. These work groups served as the primary force in determining the direction of research and conducting various research activities. Teachers made a four-year commitment either to serve directly in the cooperative study groups or to support the direction of the groups by carrying out CSG initiatives. In all instances, the primary purpose of the CSGs was to explore teachers' experiences with planning for and teaching in academically diverse secondary science and social studies classrooms.

This report, which presents findings from the initial work of the Cooperative Study Groups, specifically addresses how teachers plan in teaching an academically diverse class.

Method

Initiating the Cooperative Study Group Process.

An invitation to apply for project participation was extended to all secondary social studies and science teachers in two school districts in eastern Kansas. We sought teachers who were interested in jointly conducting research related to meeting the challenge of planning and teaching in the face of academic diversity.

Each teacher's class schedule and class composition was requested to determine the extent of academic diversity in their classes and to screen for students participating in special education programs. Since our goal was to identify a pool of teachers with whom we could work for the duration of the project, we also identified those teachers who had previously worked with students with mild handicaps and who would likely continue to have these types of students in their classes. Nevertheless, it was impossible to ensure these teachers would always have students with mild handicaps in their classes across the time period of this project.

Approximately 76 teachers expressed an interest in participating. However, phone calls to each applicant explaining the time commitments involved, reduced the pool of teachers to 52. Participating teachers were informed that they would become part of a research team that would meet and discuss problems and solutions as well as identify and implement interventions appropriate to the classroom setting. At the first meeting, teachers were organized into groups of four to eight. These groupings, referred to as Cooperative Study Groups, served as the basis for identifying issues and barriers in planning.

To facilitate the start-up of the Cooperative Study Groups, a set of questions related to the problems of teaching and planning for academically diverse groups of students was developed. The questions and questioning process were first discussed with Dr. Christopher Clark of Michigan State University, who served as a project consultant on teachers' planning processes, and were then piloted twice.

The first pilot was conducted with project staff, the second involved four teachers in a local school district that was not participating in the study. Based on this pilot, the questions and questioning format were modified and procedures for conducting the CSGs were developed and put into written form. Additionally, three project staff members were trained as moderators and six research assistants were trained as note takers and recorder assistants. Finally, the duties and responsibilities of note takers and recorder assistants were specified in writing.

Subjects

Fifty-two teachers participated in the first CSG meetings. Of the 51 teachers for whom demographic data was collected, 25 were men and 26 were women. With a mean age of 46 years (range=31-63 years), most were very experienced teachers, having taught for an average of 20 years (range=1-36 years; SD=8 years); only six teachers had taught for less than 10 years. Eleven were middle school science teachers, 18 were high school science teachers, eight were middle school social studies teachers, and 14 were high school social studies teachers. Four of the teachers held part-time positions (i.e., they taught 1-3 classes per day), the remaining taught full time.

The teachers were teaching an average of 4.66 classes per day with a total average student enrollment of 107. They averaged about two class preparations per day (range=1-4) and had one class period for planning within the school day. They reported that an average of 5.7% of the students in their classes were students with learning disabilities; in addition, an average of 11% of their students could be considered at-risk for failure in school.

Procedures and Measures

Teachers were asked to meet as a group three times in the spring of 1990. The first set of meetings for 14 groups (ranging in attendance from one to seven participants) was held in February and March. The first time the teachers met for a two-hour period after school in one of the district administration offices or at a meeting room on the campus at the University of Kansas. No meeting was held in the teachers' schools. An attempt to group high school and middle school teachers separately proved feasible for seven of the 14 groups. Teachers received ten dollars in appreciation for their participation in each of the meetings.

At each meeting, participants were asked questions about barriers and issues related to teaching in the face of academic diversity. Each group was to be asked the same set of four questions. Due to time constraints, however, not all groups discussed all four questions. The first question was always presented first to each group. The second, third, and fourth questions, discussed by 12 of the 14 groups, were presented randomly across the groups to ensure that all questions would be covered and to control for possible order effects. Teachers were asked questions that required them to think of their most academically diverse class. An academically diverse class was defined as "a class comprised of students with widely varying achievement levels such as a class with individuals with learning disabilities, other low-achieving students, as well as average-achieving students." The fourth question asked, the question reported on here was

"Thinking back on the last year of teaching, how did you plan for teaching science or social studies to an academically diverse group of students?" This question was discussed by 43 teachers in 12 groups.

Each question was posed, one at a time, by a researcher who served as a moderator for the group. Also present were two research assistants; one took notes about teachers' responses and the other audio taped the session. The teachers discussed each question for 15-20 minutes. When responses were no longer forthcoming, the moderator summarized (orally and in list form on a large tablet) the major points. The moderator then asked the group members to check the accuracy of the summarized statements. The teachers also were asked whether they wished to add anything to the listed responses. Any new suggestions were added to the list.

Next, the teachers were asked to indicate to what degree they agreed with each item or to what degree it represented a specific barrier or problem for them. For this purpose, they wrote down the summarized statements on a special form and indicated their agreement with each item on a 7-point Likert-type scale (ranging from "1" - "I strongly agree" - to "7"- "I strongly disagree"). This process of finalizing the list and rating the responses was referred to as the "Member Check" phase of data collection.

Teacher Evaluation of the Cooperative Study Group Process

Feedback from teachers in the Cooperative Study Group process was overwhelmingly positive. Except for a few personal problems or concerns, all the teachers indicated that they would be interested in participating in this type of research effort in the future. When asked about participating in a summer research effort, 28 volunteered.

Data Analysis

The implementation of the CSGs has yielded several types of information: basic demographic data about the teachers and transcripts of all CSG meetings. Reliability checks have been performed on the accuracy of these transcriptions. Finally, the data collected through the Member Check process have been compiled and categorized.

The data were analyzed by two methods: transcript evaluation and quantitative compilation. For the transcript evaluation process, the audio tapes of the meeting and the notes taken by the research assistant and the moderator were used to create a transcript of the meeting. These transcripts were used to interpret the meaning of items generated through the Member Check process and to identify themes and trends in the data that were not apparent from the Member Check data. The transcripts were read and major impressions were summarized by two independent readers who had participated

in the Cooperative Study Group meetings. These impressions were synthesized, and a set of summary statements was generated.

After all groups had met, project staff developed categories for grouping (sorting) teacher responses. All responses in the Member Checks from the 12 CSG meetings discussing this question were placed on individual 3X5 cards and grouped by the particular question to which they related. Staff then sorted each group of cards into categories. The wide range of responses from teachers made the categorization process difficult. A procedure was developed to establish four overall Category headings: (a) *General Planning Methods* -- general priorities or procedures used by teachers to plan; (b) *Factors Influencing the Planning Process*; and (c) *Specific Planning Targets* -- the various ways teachers actually plan.

A project staff member and a research assistant worked together to devise subcategories within each category as appropriate for each question. One other research assistant then sorted the cards into the developed categories and noted any difficulties they had with individual responses or categories. Some category revisions were made in response to this feedback and some alternate choices (21.43% of all responses for Question #4) were allowed. Categories and subcategories were finally identified that achieved, for Question #4, interrater reliabilities of 76.58% and 70.5% to verify the sorting of responses. These reliabilities were achieved by having two research assistants, not involved in developing the final categorization, sort responses independently into the developed categories.

Since the teachers had indicated on the Member Check forms their level of personal agreement with each item generated in their group in response to each question, it was possible to determine the relative agreement between the group-generated Member Check items and an individual teacher's viewpoint. Since Member Check items were not commensurate across groups, a method of determining within-group agreement, or the homogeneity of attitudes toward stated Member Check items within each group, was attempted. A homogeneity index was calculated for each respondent under each question by taking the standard deviation of his or her responses to the Member Check items under each question and then calculating its reciprocal, or dividing one by the standard deviation value. To determine the degree to which individuals in each of the groups were in consensus on each question, the standard deviation of the homogeneity indexes for each respondent was calculated. This calculation was carried out for each of the four questions.

The Member Check ratings also allowed us to calculate teacher agreement with the pooled items in each subcategory. In order to analyze this level of agreement,

teachers' numerical ratings for items assigned to a specific subcategory were totaled and divided by the number of teachers who had ranked those items in that subcategory. Items, or responses, with an average rating close to "1" showed that most of the teachers agreed with it (i.e., it held personal meaning for them), whereas responses having an average rating closer to "7" showed that most of the teachers did not agree (i.e., it did not hold personal meaning for them.)

Finally, transcripts of all the cooperative study groups were read and reviewed holistically to assure that issues identified quantitatively in the Member Check process reflected the qualitative tenor of the discussions in the groups. Where there was extended discussion of issues not highlighted by Member Check data, the nature and quality of those discussions are noted in the Results and Discussion below.

Results

When we asked teachers in our study groups to tell us how they plan for teaching an academically diverse group of students in their secondary science and social studies classrooms, we received a great variety of answers. For the most part teachers plan on their own, rather than with other teachers, and their planning seems to be a function, to some extent, of individual preferences and circumstances. Some teachers plan in a general way for a whole year or semester, and then plan in more detail for daily objectives; other teachers who are teaching a course they have taught before report that they do little planning on a weekly or daily basis. Some teachers carefully consider the content they want to teach; others report that for them content is a given. As a result, they plan mostly what to do with the content.

Two patterns emerge among the various priorities and procedures teachers in our groups use to plan for diversity in their classrooms: (a) teachers give early and substantial priority in their planning to activities; and (b) planning for content, at various stages in the planning process, is also important. Appendix 1 shows the results of the Member Check analysis for this question, including the subcategories of responses, the number of responses in each subcategory, the number of groups contributing responses to the subcategory, and the aggregate agreement rating for the items represented by each subcategory.

General Planning Methods

In five of our study groups, teachers reported planning by organizing content. According to four out of seven responses in these groups, planning proceeded by units;

three others indicated that planning was done by syllabus for the year, or using weekly or chapter plans.

In terms of planning format and structure, some teachers reported using written plans, others rely on mental or spontaneous planning. While some teachers work cooperatively with other subject-area teachers or in teams, many more reported that they need solitude or quiet time to do their planning. In three different groups, teachers mentioned the importance of using plans, activities, or materials that they had used before and found to be successful.

Factors Influencing the Planning Process

Teachers were influenced in their planning by two kinds of time constraints: the time available for instruction and the time and opportunities available for planning for that instruction. Across four groups, four out of five responses concerning time constraints indicated that teachers planned content according to the time available for instruction. Although teachers planned in a variety of ways at varying times, few teachers found their in-school planning periods useful for planning. More often they used that time for "paper-pushing" tasks or attending to other responsibilities. Some teachers also reported that because they did not have access to their classrooms during their planning period, they often had no suitable place in school to plan.

Specific Planning Targets

In terms of actual planning for instruction, teachers in our study groups identified 13 elements that influence their planning. By far the most frequent -- mentioned 19 times across 11 groups -- was planning for and by activities. Inner group agreement on at least half of these elements was high, (in the 1-2 range on the 7-point Likert-type scale used for Member Checks.)

The second largest subcategory under Specific Planning Targets was planning for and by content, concepts, and/or skills to be learned. This category was mentioned 13 times across nine groups. A related category -- planning for and by objectives and rationales -- includes five additional items across five groups. Overall, every group mentioned content or objectives as central to the planning process.

Teachers also considered materials when they planned -- mentioned 10 times across six groups. In addition, they also focused on how to motivate and interest students to become involved in the lesson. What techniques to use to best present a lesson was a concern that produced eight responses across five groups.

Other planning elements mentioned less often included, in descending order of frequency, planning for outcomes; strategic planning to accommodate different learning styles; planning for and by evaluation and testing; planning for variety, flexibility or classroom management; and, finally, planning according to teacher preference and interest.

Within-group agreement results. Based on the indexes of homogeneity of attitudes toward Member Check items in each group, the groups can be divided into three categories: most consistent, moderately consistent, and nonconsistent. Table 1 lists the within-group agreement results for the 12 groups with more than one participant. Values are to be interpreted in the same manner as standard deviations, that is, low values indicate less variation and more agreement among group members, whereas high values reflect more variation and less agreement. Groups #2, 3, 7, 10, and 12 showed the most consensus. The second category, moderately consistent, included Groups # 5 and 6, while the nonconsistent group was comprised of only Group #9.

Table 1

Homogeneity Indexes for Cooperative Study Group 1 Sessions

Group	Question 4
Group 1	*
Group 2	.07
Group 3	.27
Group 4	*
Group 5	.49
Group 6	.34
Group 7	.24
Group 8	* *
Group 9	.53
Group 10	.26
Group 11	* *
Group 12	.13

* complete data for only one member. ** Question not discussed by group.

Discussion

Research on teacher planning is relatively recent. As a result, most teacher education programs continue to use the basic model proposed by Ralph Tyler in 1950 (Shavelson and Stern, 1981). This linear planning model begins with the specification of objectives and ends with specifying evaluation procedures.

Russell and Hunter (1976), in discussing seven steps for planning for effective instruction, noted that teachers must identify objectives before planning a day's teaching.

However, Shavelson and Stern (1981) reported that research on teacher planning has made it clear that instructional activity rather than specification of objectives is the basic focus of teacher planning. The comments of teachers in our study groups certainly reaffirm that, at least with regard to planning for an academically diverse class, planning by activities is common practice. Responses about planning by activities made up the single largest category of responses.

However, teacher planning cannot be described by a simple formula or identification of one or two important elements. In his work on teacher planning, Clark (1983) identified two kinds of planning knowledge: teacher-effectiveness and propositional knowledge. Research in the area of teacher-effectiveness identifies relationships between teacher-behavior variables and student achievement variables. The other kind of planning knowledge--propositional knowledge that we are gaining about the practice of teaching--describes how "teachers' minds work as they plan, make decisions, teach and reflect on experiences" (p. 6). In Clark's view, teachers engage in several kinds of planning, all nested and interactive. Furthermore, he asserted that these planning processes have an impact on the curriculum taught in schools, with the actual curriculum taught being "created largely via teacher planning" (p. 13).

Suggestions in our data support Clark's observations about the impact of planning on the curriculum. For example, teachers indicated that they planned for or around content almost as often as they planned for instructional activities. Further, they indicated that activities and available materials have a substantial impact on what content to highlight. One teacher noted that although she knew that teachers were supposed to develop objectives first and then find suitable activities and materials to teach those objectives, in truth it is the other way around; she relied more on her folders of materials and activity ideas and chose objectives according to what she had to work with.

Teachers in other groups described the same planning process when they spoke of relying on activities that had been successful in the past. Sometimes teachers relied on available materials to such an extent that those materials determined the direction of their planning. In addition, teachers also influence the content taught when they make decisions about what topics to include and what topics not to include. Several teachers noted that there is more material to cover than there is instructional time available to cover it. As one teacher described it, "Lesson plans are like balloons. Some will pop. You've got to learn you can't do it all."

If teachers' content decisions are central to the planning process, both as part of the "teacher effectiveness knowledge" and as "propositional knowledge," we need to know more about how teachers make content decisions in their planning. Such knowledge is not readily obtainable as suggested by Clark's emphasis on the interactive nature of planning processes. Further its elusiveness was also suggested by comments by several teachers in our groups. These teachers said that they planned for content, for the most part, either early in their teaching careers or when they have to teach a new course. One teacher noted that, "The first year I spent all my time planning content. Now all my time is spent planning what we are going to do." Other members of her group supported this observation: "I agree, the first few years are spent on content;" and, "You do change from content to activities, especially strategy."

In a different group, a teacher who had been in the classroom for 10 years said that he only planned when a course was new or when he got a new textbook. His planning was extensive for one to two years under those circumstances, but after that he did little planning. Another teacher in another group hinted that basic content decisions, once made, did not figure prominently in his planning: "I think of the content as being a given. Activities and the time it takes are what I plan."

Such comments from teachers suggest that if researchers are to discern when and how teachers plan, they may have to seek out this information at various stages in teachers' careers as well as at various points in their planning procedures.

Conclusion

When teachers plan to teach in diverse secondary classrooms, they use a variety of resources, establish priorities and do their planning in various stages and under various environmental and time constraints. While some teachers seem to use a linear model that begins with efforts to specify objectives or concepts or discern essential knowledge for students, others use a kind of cyclical model in which they evaluate

activities and materials that have proven successful and let those considerations determine their planning. Teachers also engage in spontaneous planning, with some teachers "winging it" daily based on past careful planning, while others may change lesson plans because an activity may not be working in a particular class.

Yinger (1977) proposed a three-stage cyclical planning model for teachers whereby teachers view planning as a problem-solving process that involves evaluation of solutions and outcomes on a regular basis. Evaluation, a major aspect of Yinger's cyclical model, did not appear to be of paramount concern to teachers in our study groups, whether in evaluating student understanding or previous planning decisions related to content. Rather teachers spoke of planning for student success or planning to link teaching to the test that was to follow. Teachers also evaluate activities and materials by means of folders or files or memories of materials and/or activities that "worked" in the past. What is not clear is whether or when they revisit content decisions and whether or when they evaluate both content and instructional activities or materials based on an assessment of student understanding achieved. Most likely when teachers say that some activity or approach "worked," they mean that it successfully communicated some content or skill to students. However, teachers in our study groups did not as a general matter speak specifically of making planning decisions based on assessment information about the impact on student learning of an activity, teaching technique or materials. They did mention structuring instruction so that they are certain to cover material on which they plan to test students, so that it is clear to students what they will be tested on. Some teachers are also concerned about teaching and testing in a manner to maximize student success. But no teacher indicated that they use assessment as a means to evaluate the effectiveness of the instruction they have planned or that they use student assessment or some other means of evaluation to identify possible problem areas in their instructional planning. Within the context of planning for diversity, this is an interesting omission. It may well be an omission due to unstated assumptions that underlay teacher planning - perhaps it goes without saying that teachers will alter their planning if students don't indicate understanding. Or it may be an omission arising out of lack of awareness of the value of assessment for planning. Brophy (1986) has found that students learn more efficiently when teachers, among other specific behaviors, monitor student performance and provide corrective feedback. This can be done during drill, practice and application activities as well as during more formal evaluation activities. What is not clear at this point in the research on teacher planning is whether using student assessment information to alter or adapt planning decisions may also serve to enhance student achievement by enhancing the planning

procedures used by teachers to deliver instruction in diverse secondary science and social studies classrooms.

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Appendix 1

Cooperative Study Group Results for Question 4: Planning to Teach an Academically Diverse Group.

Response Categories/Subcategories	No. of Items	No. of Groups (N=12)	Mean Agreement Rating*
General planning methods			
By organization of content	7	5	2.59
By other methods	18	9	2.19
Factors influencing the planning process			
Resources	9	7	2.51
Conditions	8	7	2.57
Time constraints	5	4	1.80
Specific planning targets			
Activities	19	11	1.75
Content/skills to be learned	13	9	1.95
Materials	10	6	2.08
Motivation	9	6	1.65
Techniques	8	5	1.65
Objectives	6	5	2.54
Outcomes	6	4	2.25
Strategic teaching	5	3	1.81
Evaluation/Testing	3	3	1.62
Variety	3	3	1.27
Flexibility	3	3	1.70
Management/Climate	3	2	2.60
Teacher's interests	2	2	1.55

*(7 = Low agreement 1 = High agreement)